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**Final Report**  
**NASA Project # NCC-1-306**

**TROPOSPHERIC DIAGNOSTIC MODELING STUDIES OF PEM-TROPICS B FIELD  
DATA: INVESTIGATION OF THE HO<sub>x</sub>/NO<sub>x</sub>/O<sub>3</sub> PHOTOCHEMICAL SYSTEM AND  
ITS COUPLING TO SULFUR CHEMISTRY**

**Submitted to:**  
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Over the time period of this NASA grant the PI has helped plan and execute the PEM-Tropics B field program. He has also helped organize and co-chair two data workshops which have focused on the detailed analysis of PEM-Tropics B data. His direct participation in these analyses has led to his involvement in 13 manuscripts, 9 of which are in print, 2 in press, and 2 submitted. A complete list of papers is given below:

- 1) Marine Latitude/Altitude OH Distributions: Comparison of Pacific Ocean Observations with Models, Davis, D., G. Grodzinsky, G. Chen, J. Crawford, F. Eisele, L. Mauldin, D. Tanner, C. Cantrell, W. Brune, D. Tan, I. Faloona, B. Ridley, D. Montzka, J. Walega, F. Grahek, S. Sandholm, G. Sachse, S. Vay, B. Anderson, M. Avery, B. Heikes, J. Snow, D. O'Sullivan, R. Shetter, B. Lefer, D. Blake, M. Carroll, and Y. Wang, **J. Geophys. Res.**, **106**, 32691, 2001.
- 2) 160) Chemical Ionization Mass Spectrometry Technique for the detection of Dimethylsulfoxide and Ammonia, Nowak, J., L. Huey, F. Eisele, D. Tanner, R. Mauldin, C. Cantrell, E. Kosciuch, and D. Davis, **J. Geophys. Res.**, in press.
- 3) Central/eastern North Pacific photochemical precursor profiles for fall and spring seasons as recorded during several airborne field studies, DiNunno, B., D. Davis et al., **J. Geophys. Res.**, accepted.
- 4) 156) Factors controlling tropospheric O<sub>3</sub>, OH, NO<sub>x</sub>, and SO<sub>2</sub> over the tropical Pacific during PEM-Tropics B, Wang, Y., S. Liu, D. Davis, P. Wine, S. Sandholm, E. Atlas, M. Avery, D. Blake, N. Blake, W. Brune, B. Heikes, G. Sachse, R. Shetter, H. Singh, R. Talbot, and D. Tan, **J. Geophys. Res.**, **106**, 32733, 2001.
- 5) Relationship between OH measurements on two different NASA aircraft during PEM-Tropics B, Eisele, F., R. Mauldin, D. Tanner, C. Cantrell, E. Kosciuch, B. Brune, D. Tan, G. Chen and D. Davis, **J. Geophys. Res.**, **106**, 32683, 2001.
- 6) Pacific Exploratory Mission in the Tropical Pacific: PEM-Tropics B, March-April 1999, Raper, J., M. Kleb, D. Davis, D. Jacob, R. Newell, H. Fuelberg, R. Bendura, J. Hoell, and R. McNeal, **J. Geophys. Res.**, **106**, 32401, 2001. [0]

- 7) Measurements of OH aboard the NASA P-3 during PEM-Tropics B, Mauldin, R. L., F. Eisele, D. Tanner, C. Cantrell, E. Kosciuch, J. Nowak, G. Chen, L. Wang, D. Davis, B. Ridley, and B. Lefer, **J. Geophys. Res.**, **106**, 32657, 2001. [0]
- 8) Seasonal Differences in the Photochemistry of the South Pacific: A Comparison of Observations and Model Results From PEM-Tropics A and B, Olson, J. R., J. Crawford, D. Davis, G. Chen, M. Avery, J. Barrick, G. Sachse, S. Vay, S. Sandholm, D. Tan, B. Brune, I. Faloona, B. Heikes, R. Shetter, B. Lefer, H. Singh, R. Talbot, and D. Blake, **J. Geophys. Res.**, **106**, 32749, 2001. [0]
- 9) Formaldehyde over the central Pacific during PEM-Tropics, Heikes, B. D., J. Snow, P. Egli, D. O'Sullivan, J. Crawford, J. Olson, G. Chen, D. Davis, N. Blake, and D. Blake, **J. Geophys. Res.**, **106**, 32717, 2001. [0]
- 10) Airborne Observations of DMSO, DMS, and OH at Marine Tropical Latitudes, Nowak, J., D. Davis, G. Chen, F. Eisele, D. Tanner, L. Mauldin III, C. Cantrell E. Kosciuch, A. Bandy, D. Thornton, and A. Clarke, **Geophys. Res. Lett.**, p 2201-204, 2001. [0]
- 11) Impact of Ship Emissions on Marine Boundary Layer NO<sub>x</sub> and SO<sub>2</sub> Distributions over the Pacific Basin, Davis, D., G. Grodzinsky, P. Kasibhatla, J. Crawford, G. Chen, S. Liu, A. Bandy, D. Thornton, H. Guan, and S. Sandholm, **Geophys. Res. Lett.**, **28**, p 235-238, 2001. [0]
- 12) Dispersion and Chemical Evolution of Ship Plumes in the Marine Boundary Layer: Investigation of O<sub>3</sub>/NO<sub>y</sub>/HO<sub>x</sub> Chemistry, C. H. Song, G. Chen, J. Crawford, S. H. Hanna, and D. D. Davis, **J. Geophys. Res.**, submitted
- 13) An Assessment of Ozone Photochemistry in the Central/eastern North Pacific as Determined from Multi-Year Airborne Field Studies, B. DiNunno, D. Davis, G. Chen, J. Crawford, J. Olson, and S. Liu, **J. Geophys. Res.**, submitted.